ES202 Final Exam Study Guide (Winter 2021)
(updated Winter 2021)

Exam Logistics: The midterm exam will occur on Wednesday March 17, 2021, worth a total of 120 points, 1 point per question x 120 questions. Exam question styles will include multiple choice, true/false, completion, short list, short definition, lab-style problems, essay / sketching / drawing, map calculations / identification, identification of surface landforms from images. The exam will focus on new material from mid-term, but with basic fundamental questions related to theme concepts covered early in the class. The online exam will be available as a link at the top of the General Section of the ES202 Lecture Class Moodle page, between 8 AM and 11 PM on exam day. Once a student begins the exam, it will be timed for 2 hours. You may begin the exam at any time between 8 AM and 11 PM, but make sure that once you start it, you have enough time before the 11 PM cut-off availability to complete the exam. The exam questions will be submitted only once, with no opportunities for resubmissions. The Professor will be manually grading your exams and reviewing your answers, in addition to the automated Moodle grading tools; typos and misspelled words in short answer will be evaluated for correctness in content. Additional testing accommodations are possible by prior arrangement with the professor.

Recommended Study Techniques

1) go over pre-lab questions / study them
2) review the "How to Study" sheet handed out at beginning of term
3) use the concepts below as a guide to help you focus on your notes
4) memorize terms and concepts
5) go back over the labs and make sure you can do the tricks / skills
6) review some of the important figures in your lab manual and text
7) go to the lab and look at the lab answer keys, and study the physical models / displays.
8) review the techniques for working with maps / air photos
9) Go over and study the Moodle practice quiz questions and Video Review Questions

CLASS NOTE KEY WORDS

Topo Map Review

https://people.wou.edu/~taylors/g202/topomaps.pdf

topographic maps
north arrow
magnetic declination
map scale
fractional scale
graphical scale
longitude latitude
township-range-section
equator
prime meridian
parallels
angular measurement
7.5 min quadrangle
contour interval
index contour
law of V's / streams
~~air photos~~
~~stereovision~~

Landscape Analysis

https://people.wou.edu/~taylors/g202/landscape_analysis.pdf

Four Criteria:
- Landform
- Material
- Age
- Process

Bedrock vs. regolith
Wind-water-ice-gravity
Upland vs. Valley bottom
Hillslope
Active Channel
Floodplain
Terrace

~~*Soil/Mass-Wasting*~~

~~bedrock~~
~~soil~~
~~regolith~~
~~colluvium~~
~~alluvium~~
~~drift~~
~~lacustrine~~
~~anthropogenic~~
~~aeolian~~
~~clay~~
~~mass-wasting~~
~~slope-gradient~~
~~angle-of-repose~~
~~creep~~
~~slide~~
~~flow~~
~~debris-flow~~
~~mud-flow~~
~~landslide~~
~~debris-slide~~
~~solifluction~~
~~slump~~
~~rock-fall~~

Hydrologic Cycle
https://people.wou.edu/~taylors/g202/hydro.pdf
hydrologic cycle
precipitation
evaporation
advection
convection
infiltration
evapotranspiration
condensation
vegetative interception
runoff
soil moisture
ground water
surface water
rivers
lakes
oceans
atmospheric moisture
glaciers / ice budget
biologic water

Rivers
https://people.wou.edu/~taylors/g202/rivers.pdf
Rivers / fluvial
stream gradient
channel
floodplain
oxbow lake
meandering
levees
cutoff
cutbank
floodplain
terrace
stream gradient
bedload
suspended load
dissolved load
braided
straight
normal discharge
flood discharge
capacity vs. competence
dendritic
trellis
radial
alluvial fans
deltas
base level
watershed
drainage divide

Groundwater / Karst
https://people.wou.edu/~taylors/g202/gwkrst.pdf
Groundwater
connate water
meteoric water
juvenile water
porosity
permeability
Porosity Types
    intergranular porosity
    Fracture porosity
    solution porosity
    vesicular porosity
~~Basics of Darcy's Law~~
permeable / impermeable
Zone of Aeration
Vadose Zone
Zone of Saturation
Capillary Zone
Water Table
Groundwater Contours
~~Water Table Gradient~~
Cone of Depression
~~Hydraulic Gradient~~
well
confined aquifer
unconfined aquifer
spring / seep
~~perched aquifer~~
aquitard / aquiclude
~~potentiometric surface~~
artesian aquifer
free-flowing artesian aquifer
~~groundwater contamination~~
~~upgradient / downgradient~~
~~groundwater subsidence~~
~~karst~~
dissolution
limestone
~~evaporites~~
~~solution depressions~~
~~caves / caverns~~
sink holes
~~sinking streams~~
~~karst springs~~
~~karst collapse~~
~~fracture control of caverns~~
solution sinkholes
collapse sinkholes
karst lakes / sink hole lakes
~~swallow holes~~
caves
cave deposits
stalactites
stalagmites

Glaciers
https://people.wou.edu/~taylors/g202/glacier.pdf
glaciers
snowfields
snow-firn-ice
global ice budget
alpine glaciers
continental glaciers
cirque glaciers
piedmont glaciers
ice sheets
ice shelf
temperate glacier
polar glacier
basal slip
internal ice flow
crevasse / fracture
transverse crevasse
longitudinal crevasse
glacial surging
snow line
zone of accumulation
zone of ablation
ice advance
ice retreat
static equilibrium
glacial erosion
plucking
abrasion
rock flour
glacial striations
u-shape valleys
v-shape valleys
hanging valleys
paternoster lakes
cirque
tarn
fjords
aretes

horn
col
roche moutonee
glacial pavement
drift
till
outwash
sorted / stratified
unsorted / unstratified
moraine
lateral moraine
medial moraine
end moraine
terminal moraine
recessional moraine
ground moraine
glacial erratics
outwash plain
kettles
drumlins
eskers
kames

Climate Change
glacial climate
interglacial climate
climate change
Pleistocene glaciation
Oxygen Isotope record
Laurentide Ice Sheet
Glacial / Pluvial Lakes
Milankovitch Theory

Deserts
https://people.wou.edu/~taylors/g202/desert.pdf
arid climate
desert
semi-arid
polar deserts
sub-tropical deserts
orographic / rain shadow effect
Playa lakes
salt flats
pluvial lakes
differential erosion
butte
mesa
Inselbergs
pediments
badlands
piedmont
mountain front
alluvial fan
bajada
bolson
closed drainage
arroyo
aeolian
deflation
blow outs
ventifacts
desert pavement
desert varnish
sand dune
erg
dune morphology
wind direction
barchan dune
parabolic dune
transverse dune
longitudinal dune
loess
desertification

Coasts
https://people.wou.edu/~taylors/g202/coast.pdf
Ocean
Coast
Marginal Marine
salinity
density
ocean convection
~~tidal bulge~~
~~spring tide~~
~~neap tides~~
~~tidal range~~
~~daily tidal cycle~~
~~ocean currents~~
waves
storm suge
hurricane
~~orbital waves~~
~~wave crest~~
~~wave trough~~
~~wave height~~
tsunami
~~wave length~~
~~wave velocity~~
~~wave base~~
surf zone
breaker
swash
longshore current
rip currents
beach
foreshore
wave-cut platform
wave-cut terrace
sand beach vs. rock coast
longshore drift
spit
baymouth bar
tombolo
tied island
jetties
groins
breakwater
erosional headlands
sea cliffs
sea stacks
sea arches
barrier islands
back barrier lagoon
tidal inlet
delta
submergent
emergent
fjords
~~estuaries~~
~~coastal uplift~~
~~coastal subsidence~~
~~sea level rise~~
~~sea level fall~~
~~reefs~~

Questions for Thought

Do you know how to deal with maps?... profiles, map reading, directions, topography, contour lines, elevations?
Can you calculate a stream gradient? I.D. a channel pattern and drainage pattern.
What about simple unit conversions from English to Metric?
Map Scale and Distance Calculations: graphical scale, verbal scale, fractional scale.
What's the difference between a floodplain and a terrace?
What are the diagnostic landscape features associated with river environments? Can you identify them on a block diagram by name?
What are drainage divides and how are watersheds defined?
What are the hazards associated with mass wasting and rivers?
Can you draw, label, and discuss the hydrologic cycle in detail?
~~Draw a matrix summary of the landslide classification system based on material and process.~~
Can you draw / sketch showing the difference between an unconfined aquifer and a confined aquifer.
Can you label a block diagram showing the primary features of karst-cave-limestone landscapes.
How do glaciers and glacial ice form?
Why do glaciers flow?
How does the global ice budget relate to sea level / vice versa? How does it relate to climate?
What are the physical differences between a continental and alpine glacier?
What are the erosional and depositional effects of glaciation at the earth's surface?
How does a fluvial-dominated landscape compare to a glacial-dominated landscape?
What are the diagnostic landforms associated with alpine glaciers vs. continental glaciers? Can you identify them on a block diagram by name?
How has glaciation affected North America over the past 2 million years?
How are glaciations related to sea level fluctuations?
What are the precipitation / vegetative characteristics of a "desert"? Are all deserts hot?
How are landforms in a desert different from humid climates and why?
~~How do ocean tides form?~~
~~What drives ocean circulation / currents?~~
How do ocean waves form? What is their morphology and physics?
What coastal landforms are associated with emergent coasts? with submergent coasts?
What are the primary hazards associated with coastal areas... particularly coastal areas in western Oregon?
How do rocky shorelines erode / evolve over time?
Can you identify the diagnostic landforms associated with erosion and deposition in coastal areas? Can you label and identify them on a block diagram?
What are the basic beach transportation processes?

2. Lab Skills to Work On

Locate positions on a map?
I.D. contour interval, hills, valleys, etc?
Calculate stream gradient?
recognize steep vs. gentle topography?
Determine azimuth compass bearings between two points?
Location by longitude and latitue
Identify basic river and hillslope features on a topographic map: e.g. floodplain, channel, oxbow, terrace, braided river, meandering river, hillslope, alluvial fan, ridge top, valley bottom
Drawing contour lines in general (interpoloating points of constant elevation).
Calculating gradients from maps.

~~Calculating groundwater gradients.~~
Measuring distances, directions, and scales on a topographic map.
Reading contour lines / elevations from a topographic map.
Determining gradients from a topographic map (slope gradients, stream gradients).
Calculating basic rates of process (change in process per unit time: e.g. rate of delta growth, rate of coastal erosion, rate of uplift, etc.)
~~Interpreting aerial photographs / seeing in stereoscopic vision.~~
Identifying actual landforms from slides / photos.
Identifying landforms and geomorphic processes on topographic maps (e.g. glacial forms, karst forms, river forms, desert forms, etc.).
Determining the direction of ice flow from drumlins, or from terminal / end moraine patterns.
Can you label and identify landforms from different climates on a block model?
Can you identify landforms from slides / photographs?